

The four major bridges (Golden Gate, Richmond-San Rafael, Carquinez and Benicia-Martinez) vessels have to pass between the sea and the terminal can present hazards if vessels do not stay within the designated traffic lanes and channels. The channels, bridge piers and bridge spans are well marked with buoys, flashing lights and/or horns, and the California Department of Transportation is fitting the bridges with radio beacons.

Fog and storms are meteorological conditions that make navigation difficult. Fog occurs primarily during the summer months, blowing in through the Golden Gate in the late afternoon and burning off during the late morning. Storm conditions are typical in the winter. Some types of commercial vessels, including those carrying products such as fuel oil, have been restricted from transiting the Bay during periods of intense fog. Fog does not pose a serious problem if ship navigation radar is in good condition; however, coupled with high vessel traffic, severe tides and currents and straying ships navigation can be made extremely difficult.

While inclement weather plays a role as a navigational hazard because of its unpredictability, vessel traffic poses perhaps the greatest hazard to vessels transiting the Bay area waterways. While Coast Guard regulations require large commercial and naval vessels to travel in their designated traffic lanes while moving in inland waterways, smaller commercial vessels, such as tug boats, ferry boats and recreational vessels have no such requirement. Ferry vessels pose a special hazard because they often travel, of necessity, across the main shipping channels, and their numbers have greatly increased. In 1974, there were 21,000 ferry transits within the Bay; by 1990, the number had grown to 58,000.

Tidal action causes very strong currents throughout the Bay Area during periods of maximum ebb and maximum flood tides. Currents above two knots are considered to be strong and potentially hazardous to vessels during slow speed maneuvering if not properly "corrected for. As one would expect, the strongest currents occur at the Golden Gate, with the average maximum flood being 3.3 knots and the maximum ebb being 4.5 knots.

### **3. Traffic at Shore's Marine Terminal**

Shore Terminals LLC leases tankage to various companies who utilize tank vessels and pipelines to deliver crude oil and products. These commodities ship out of the facility by tank vessel, rail, truck and pipeline. An average of 117 tankers and barges called on Shore's Terminal over the last four years as shown in the table below.